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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,186	09/26/2003	Michael Thomas Greene	51249/RAG/Z74	9829

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EXAMINER	
MURRAY, DANIEL C	
ART UNIT	PAPER NUMBER
2143	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/672,186	GREENE, MICHAEL THOMAS	
	Examiner	Art Unit	
	DANIEL MURRAY	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17JAN2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17JAN2008 has been entered.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-6** are rejected under 35 U.S.C. 102(b) as being anticipated by **Andreev et al. (US Patent Publication # US 2001/0018759 A1).**

a) Consider **claim 1,** Andreev et al. clearly show and disclose, a method of determining the routing (figure2, abstract, paragraph [0002], paragraph [0088], paragraph [0091], paragraph [0096]) of interconnected regions (figure 11a, figure 11b, figure 11c, figure 11d, abstract, paragraph [0148]) of a routing problem by considering all required connections in parallel independently (figure2, figure 3, abstract, paragraph [0033], paragraph [0034], paragraph [0088], paragraph [0091], paragraph [0096]) and only attempting to resolve crossing conflicts only (figure 2, abstract, paragraph [0088], paragraph [0092], paragraph [0145], paragraph [0146], paragraph [0187], paragraph [0188], paragraph [0190],

paragraph [0211], paragraph [0215], paragraph [0277]) when at least some contextual information about a region and the paths that cross in the region has been assembled (figure2, figure3, figure 8h, figure 9, abstract, paragraph [0089], paragraph [0102], paragraph [0124], paragraph [0143], paragraph [0187], paragraph [0210], paragraph [214]).

b) Consider **claim 2,** and **as applied to claim 1 above,** Andreev et al. clearly show and disclose, the method according to claim 1, wherein resolving of crossing conflicts is attempted only (figure 2, abstract, paragraph [0088], paragraph [0092], paragraph [0145], paragraph [0146], paragraph [0187], paragraph [0188], paragraph [0190], paragraph [0211], paragraph [0215], paragraph [0277]) when all possible relevant contextual information has been assembled (figure2, figure3, figure 8h, figure 9, abstract, paragraph [0089], paragraph [0102], paragraph [0124], paragraph [0143], paragraph [0187], paragraph [0210], paragraph [214]).

c) Consider **claim 3,** and **as applied to claim 1 above,** Andreev et al. clearly show and disclose, the method according to claim 1, comprising the steps of:

(a) defining, for each set of regions to be connected (figure 11a, figure 11b, figure 11c, figure 11d, abstract, paragraph [0148]), routing which represents a suitable manner of connecting them (figure2, abstract, paragraph [0002], paragraph [0088], paragraph [0091], paragraph [0096], paragraph [0190]), respecting only those crossing conflicts (paragraph [0145], paragraph [0146], paragraph [0187], paragraph [0188], paragraph [0211], paragraph [0215], paragraph [0277]) which have been explicitly registered with the set currently being considered (figure2, abstract, paragraph [0088], paragraph [0089]paragraph [0190]);

(b) examining connections across shared boundaries (paragraph [0148]);

(c) collating all such proposed routing and resolving any crossing conflicts (paragraph [0145], paragraph [0146], paragraph [0187], paragraph [0188], paragraph [0211], paragraph [0215], paragraph [0277]) in a symmetric manner (figure 2, abstract, paragraph [0033], paragraph [0089], paragraph [0091], paragraph [0096]);

(d) registering such crossing conflicts (paragraph [0145], paragraph [0146], paragraph [0187], paragraph [0188], paragraph [0211], paragraph [0215], paragraph [0277]) with the sets of regions which will be required to respect them on the next pass (figure 2, abstract, paragraph [0033], paragraph [0088]);

(e) repeating steps (a) to (c) until a sufficient completion and quality of routing solution is attained (paragraph [0092]); and

(f) converting the routing into suitable geometric representations of routing paths in a way which takes all desired routing into account symmetrically and simultaneously (figure 2, figure 3, figure 9, figure 10, figure 11a, abstract, paragraph [0033], paragraph [0038], paragraph [0088], paragraph [0093], paragraph [0095], paragraph [0096]).

d) Consider **claim 4**, and **as applied to claim 3 above,** Andreev et al. clearly show and disclose, the method according to claim 3, in which the regions are polygons (figure 11a, figure 11b, figure 11c) and the shared boundaries are edges (figure 11a, figure 11b, figure 11c, figure 11d, paragraph [0148]).

e) Consider **claim 5,** and **as applied to claim 1 above,** Andreev et al. clearly show and disclose, the method according to claim 1, wherein the interconnected regions (figure 11a, figure 11b, figure 11c, figure 11d, abstract, paragraph [0148]) are regions of an electrical circuit (figure 1, paragraph [0015], paragraph [0033], paragraph [0034]).

f) Consider **claim 6,** Andreev et al. clearly show and disclose, a computer-implemented method (paragraph [0034], paragraph [0329]) of determining the routing (figure2, abstract, paragraph [0002], paragraph [0088], paragraph [0091], paragraph [0096]) of interconnected regions of a routing problem (figure 11a, figure 11b, figure 11c, figure 11d, abstract, paragraph [0148]), the interconnected regions (figure 11a, figure 11b, figure 11c, figure 11d, abstract, paragraph [0148]) being regions of an electrical circuit (figure 1, paragraph [0015], paragraph [0033], paragraph [0034]), by considering all required connections in parallel independently (figure2, figure 3, abstract, paragraph [0033], paragraph [0034], paragraph [0088], paragraph [0091], paragraph [0096]) and attempting to resolve conflicts only (figure 2, abstract, paragraph [0088], paragraph [0092], paragraph [0145], paragraph [0190]) when at least some contextual information about a region and the paths which cross there has been assembled (figure2, figure3, abstract, paragraph [0089], paragraph [0102], paragraph [0124]).

Response to Arguments

2. Applicant's arguments filed 17JAN2008 have been fully considered but they are not persuasive.

Applicant argues Andreev et al. does not consider all connections independently and in parallel.

The Examiner respectfully disagrees, Applicant states "A method of determining the routing… by considering *all* required connection *in parallel*" several times throughout the remarks skimming over the fact that the claims indicate "… considering all *required* connections in parallel". Though larger nets maybe split into smaller subnets to avoid conflicts between regions the required connections within those subnets are considered independently and in parallel. Also the presence of

a locking mechanism does not mean that all nets in a region are not considered in parallel independently. The locking mechanism introduces a delay when there is a conflict between nets in a region and only allows one net to consider that connection at a time. Simply because one net's consideration of a connection is delayed so another can consider it does not mean they are not being processed in parallel or simultaneously (i.e. at the same time).

Furthermore, Applicant seems to define the term independence to include symmetry and isolation. The claim language is given the broadest interpretation. While Applicant is free to attach a more specific meaning to a term than is commonly considered that specificity need to be reflected in the claims language. Referring to a portion of the amended claim language as an example "… considering all required connections in parallel independently". Two items, in this case connections, can be considered independently from one another without being considered the same way (i.e. symmetrically) or in isolation.

Applicant also argues that the present invention allows the parallel routing of nets where they overlap, wherein each conflicting connection considered that is between the nets is considered in parallel, independently (to include having every connection considered the same way (i.e. symmetrically and in isolation from other connections), and simultaneously (i.e. where a connection overlaps two nets, is not only considered in parallel but that the conflicted connection is considered by both nets at the same time without regard to each other's consideration of the conflicting connection) by both nets. However, this is not clearly reflected in the claims.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Andreev et al. (US Patent # US 6,324,674 B2) disclose: "Method and Apparatus for Parallel Simultaneous Global and Detail Routing"
- Gasanov et al. (US Patent # US 6,253,363 B1) disclose: "Net Routing Using Basis Element Decomposition"
- Habra et al. (US Patent # 5,613,842) disclose: "Parallel Approach to Chip Wiring"
- Ling et al. (US Patent # US 6,223,329 B1) disclose: "Hybrid Design Method and Apparatus for Computer-Aided Circuit Design"
- Raspopovic et al. (US Patent # US 6,247,167 B1) disclose: "Method and Apparatus for Parallel Steiner Tree Routing"
- Rostoker et al. (US Patent # 5,495,419) disclose: "Integrated Circuit Physical Design Automation System Utilizing Optimization Process Decomposition and Parallel Processing"
- Rostoker et al. (US Patent # 5,636,125) disclose: "Computer Implemented Method for Producing Optimized Cell Placement for Integrated Circuit Chip"
- Rostoker et al. (US Patent # 5,742,510) disclose: "Simultaneous Placement and Routing (SPAR) Method for Integrated Circuit Physical Design Automation System"
- Scepanovic et al. (US Patent # 5,638,293) disclose: "Optimal Pad Location Method for Microelectronic Circuit Cell Placement"

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL MURRAY whose telephone number is 571-270-1773. The examiner can normally be reached on Monday - Friday 0800-1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571)-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system,

see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCM

/Daniel Murray/
Examiner, Art Unit 2143

/Kenny S Lin/
Primary Examiner, Art Unit 2152